

Tropical Cyclone Report
Hurricane Daniel
23 July - 05 August 2000

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11 September 2000

Daniel was a 110-knot hurricane in the eastern Pacific Ocean basin and then it threatened Hawaii while weakening. Daniel passed just north of Hawaii and produced rough surf conditions there.

a. Synoptic history

Daniel's origin is associated with a tropical wave that moved from Africa to the Atlantic on 8 July. This wave moved westward across the tropical Atlantic, the Caribbean, and Central America without distinction. It was not until 23 July that the wave's weather became well organized. It is estimated from satellite imagery that a tropical depression formed on the 23rd, south of Mexico. The best track listing of center positions, maximum one-minute wind speeds, and minimum central pressures begins at this time and is given in Table 1. Figure 1 is a plot of the best track. Figures 2 and 3 show plots of best-track wind speed and pressure curves as a function of time, along with the data on which they are based. Best track data west of 140 ° west longitude in the above table and figures were provided by the Central Pacific Hurricane Center at Honolulu.

The track begins 575 n mi south-southeast of Manzanillo, Mexico on 23 July and extends west-northwestward across the eastern and central Pacific basins to just north of Hawaii by 1 August. Daniel was a hurricane from the 24th to the 29th and maximum winds reached 110 knots on the 25th and 26th while still in the eastern Pacific basin. Winds fluctuated from 90 knots on the 27th to 105 knots on the 28 and then weakened to tropical storm levels on the 30th. On the 31st, Daniel turned from west-northwest to northwestward and its center passed parallel to and about 120 n mi north of the Hawaiian island chain over the next two days. Its strongest winds did not affect Hawaii. Daniel weakened to a tropical storm on the 30th, to a depression on the 3rd, and finally dissipated on the 5th about 1000 n mi northwest of Hawaii.

A subtropical ridge anchored to the north was Daniel's controlling steering feature until the track gradually turned from west-northwest to northwestward on the 30th and 31st, into a weakness in the ridge near Hawaii. Daniel's forward speed was generally from 15 to 20 knots, except when it slowed to less than 10 knots while making the turn toward the northwest.

b. Meteorological statistics

Center positions are taken from satellite images and intensity estimates are based on

the Dvorak satellite method, except for about 60 hours of Air Force reconnaissance data from the 30th to the 1st. The highest flight level wind speed during this period was 86 knots at 850 millibars. This value was an outlier as all other reconnaissance flight level wind speeds were below 60 knots and is not shown in Fig. 2. QUICKSCAT and SSM/I microwave satellite wind fields were used during Daniel's formative stage to help determine the existence of, and to locate, the low level circulation center.

c. Casualty and damage statistics

There were no reports of death or damage. There were reports of rough surf conditions on the big island of Hawaii and on Maui's east-facing coast.

d. Forecast and warning critique

The official average track forecast errors for forecasts issued in the eastern Pacific basin ranged from 50 nautical miles at 24 hours to 79 nautical at 48 hours to 190 nautical miles at 72 hours (21 cases). These errors are 30 to 40 percent smaller than the 1990-99 mean official errors. CLIPER errors for Daniel are also considerably smaller than their 1990-99 mean values. These small errors may be related to the small variation of track heading. The track heading varied from only 275 to 295 degrees during the five days of verification. The bias of the official intensity errors was small...+3.6 knots at 72 hours, compared to the ten-year average of -6.2 knots.

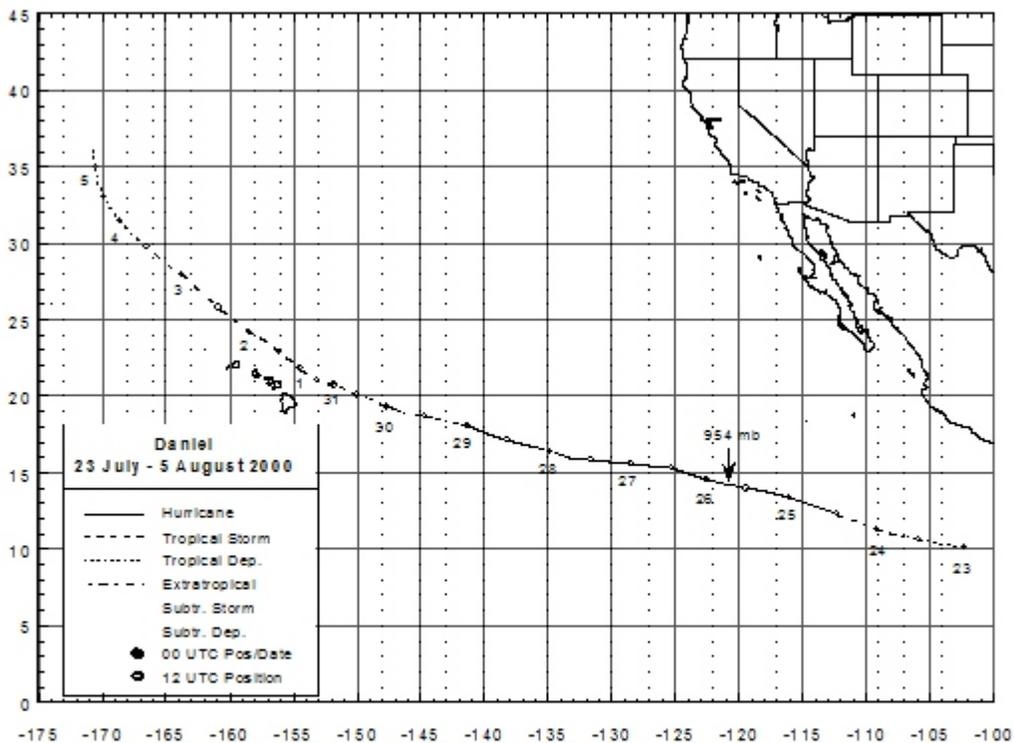


Fig. 1. Best track positions for Hurricane Daniel, 23 July - 5 August 2000.

Table 1. Best track for Hurricane Daniel, 23 July - 05 August, 2000. Data west of 140 ° west longitude provided by the Central Pacific Hurricane Center at Honolulu.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
23/0000	10.1	102.3	1009	25	tropical depression
23/0600	10.3	104.1	1009	30	"
23/1200	10.6	105.9	1007	30	"
23/1800	10.9	107.6	1004	35	tropical storm
24/0000	11.3	109.1	1001	45	"
24/0600	11.8	110.7	997	55	"
24/1200	12.3	112.3	991	65	hurricane
24/1800	12.9	114.1	980	75	"
25/0000	13.4	116.0	970	95	"
25/0600	13.8	117.8	964	100	"
25/1200	14.0	119.4	955	105	"
25/1800	14.3	121.1	954	110	"
26/0000	14.5	122.5	954	110	"
26/0600	14.9	123.9	956	105	"
26/1200	15.3	125.3	959	105	"
26/1800	15.5	127.0	961	105	"
27/0000	15.6	128.5	963	100	"
27/0600	15.7	130.1	964	95	"
27/1200	15.9	131.6	965	90	"
27/1800	16.0	133.2	964	95	"
28/0000	16.4	134.8	962	95	"
28/0600	16.8	136.4	961	105	"
28/1200	17.2	138.2	963	100	"
28/1800	17.5	139.6	968	90	"
29/0000	18.0	141.3	980	80	"
29/0600	18.4	142.9	990	65	"
29/1200	18.7	144.6	990	65	"
29/1800	18.9	146.3	990	65	"

Table 1 (continued).

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
30/0000	19.3	147.7	995	60	tropical storm
30/0600	19.8	148.9	997	55	“
30/1200	20.1	150.0	997	55	“
30/1800	20.5	151.0	995	50	“
31/0000	20.7	151.8	993	55	“
31/0600	20.8	152.5	995	50	“
31/1200	21.0	153.1	998	45	“
31/1800	21.3	153.8	993	60	“
01/0000	21.8	154.5	998	60	“
01/0600	22.3	155.2	1001	50	“
01/1200	22.9	156.1	1004	45	“
01/1800	23.6	157.2	1006	45	“
02/0000	24.2	158.4	1008	40	“
02/0600	25.0	159.6	1006	45	“
02/1200	25.8	160.9	1007	45	“
02/1800	26.9	162.3	1008	45	“
03/0000	27.9	163.7	1010	40	“
03/0600	28.8	165.2	1008	35	“
03/1200	29.8	166.5	1009	30	tropical depression
03/1800	30.5	167.6	1010	30	“
04/0000	31.4	168.6	1012	30	“
04/0600	32.2	169.3	1012	30	“
04/1200	33.0	169.9	1013	25	“
04/1800	33.9	170.3	1015	25	“
05/0000	35.0	170.5	1017	25	“
05/0600	36.1	170.7	1017	25	“
26/0000	14.5	122.4	954	110	minimum pressure

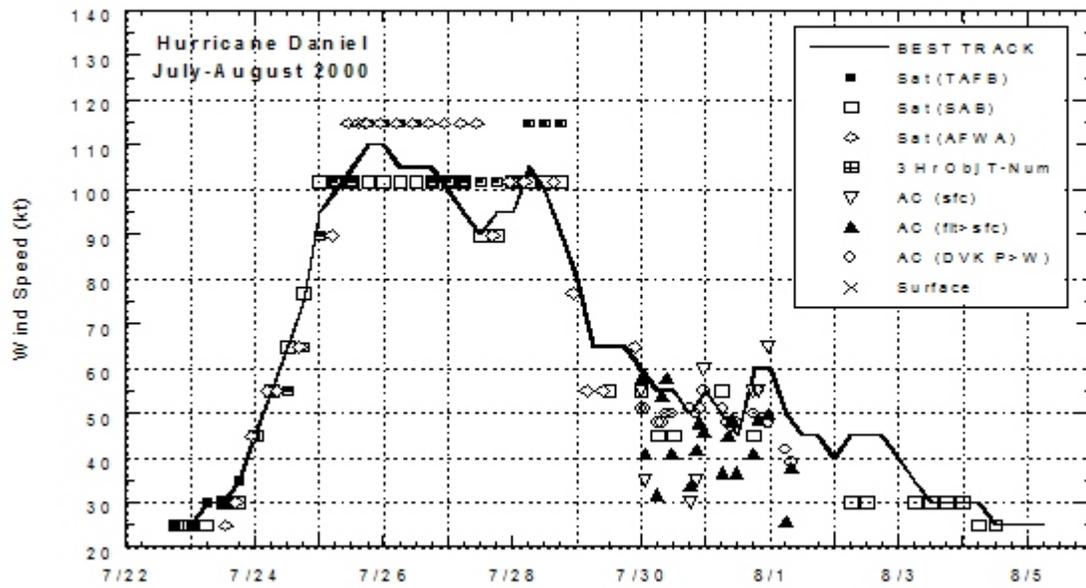


Fig. 2. Best track one-min. wind speed curve, 23 July - 5 August 2000.

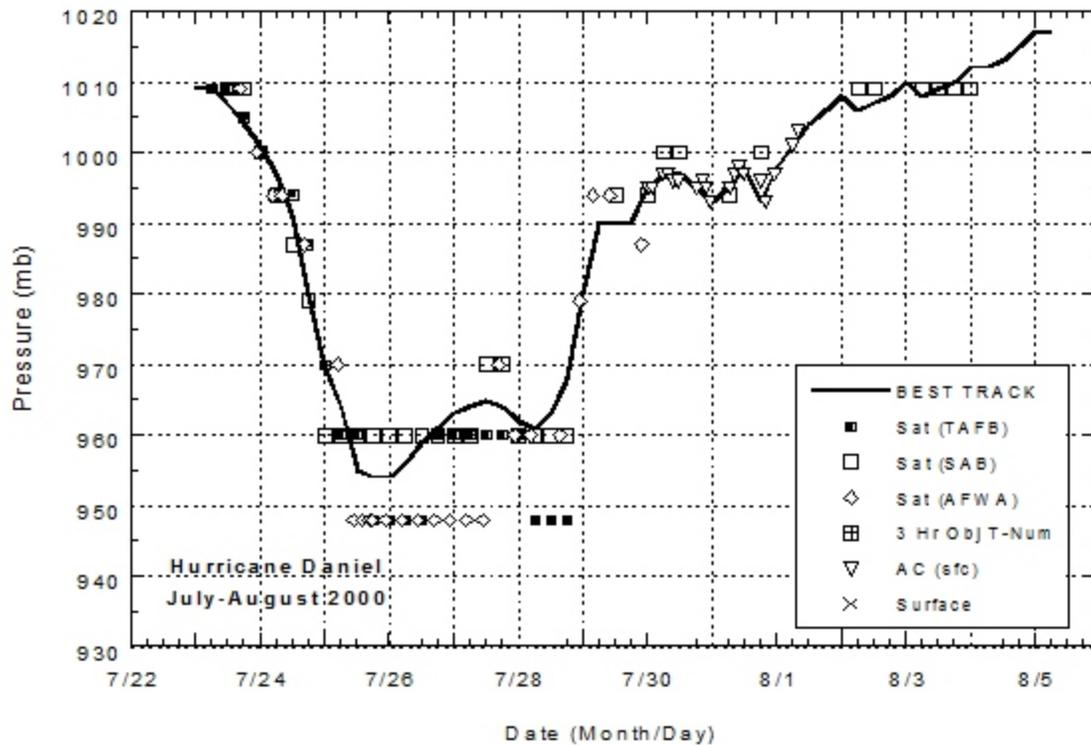


Fig. 3. Best track minimum central pressure curve, 23 Jul - 5 August 2000.